Corrosion Inhibition Performance of a Novel Cationic Surfactant for protection of Carbon Steel Pipeline in Acidic Media

M.A. Hegazy¹, M. Abdallah^{2,3,*}, M. Alfakeer⁴, H. Ahmed³

¹ Egyptian Petroleum Research Institute (EPRI), Nasr City, Cairo, Egypt

² Chemistry Department, Faculty of Applied Sciences, Umm Al-Qura University, Makkah, Saudi Arabia

³ Chemistry Dept., Faculty of Science, Benha University, Benha, Egypt

⁴ Chemistry Dept., Faculty of Science, Princess Nourah bint Abdulrahman University -Riyadh, Saudi Arabia

*E-mail: metwally555@yahoo.com

doi: 10.20964/2018.07.53

Received: 18 March 2018 / Accepted: 6 May 2018 / Published: 5 June 2018

The corrosion inhibiting action of a novel cationic surfactant on the dissolution of carbon steel (C-steel) in 1M HCl has been investigated using weight loss, electrochemical impedance spectroscopy and potentiodynamic polarization techniques. The effect of inhibitor concentration and temperature on the corrosion rate of C-steel was determined from weight loss approach. While the electrochemical and potentiodynamic measurements were used to explain the behavior of C-steel at a temperature 20 °C. Adsorption of the cationic surfactant on the surface of the C-steel pipeline is a mixture of physical and chemical adsorption and obeys Langmuir isotherm. The thermodynamic data of activation and adsorption were calculated and explained.

Keywords: C-steel; cationic surfactant, Adsorption; corrosion inhibitors; Interfaces

[FULL TEXT](#)

© 2018 The Authors. Published by ESG (www.electrochemsci.org). This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).